LAB 13: TWO-DIMENSIONAL ARRAY

OBJECTIVES FOR STUDENTS

1. Write and create two-dimensional array.
   [*Menulis dan membina tatasusunan dua dimensi.*]

2. Write and use two-dimensional array with functions.
   [*Menulis tatasusunan dua dimensi bersama fungsi.*]

ASSUMPTIONS

1. Students should have knowledge in using loop statement.
   [*Pelajar sepatutnya mempunyai pengetahuan dalam menggunakan pernyataan gelung.*]

2. Students should have knowledge in passing arguments to functions.
   [*Pelajar sepatutnya mempunyai pengetahuan dalam menghantar argument kepada fungsi.*]

3. Students should have knowledge in manipulating basic array.
   [*Pelajar sepatutnya mempunyai pengetahuan memanipulasi tatasusunan asas.*]

LAB EXERCISES

EXERCISE 1:
[*LATIHAN 1*]

1. Show the output of Program 13.1 and answer the following questions.
   [*Paparkan output bagi Program 13.1 dan jawab soalan-soalan berikut.*]

```
1    //Program 13.1
2    #include <stdio.h>
3    #include <conio.h>
4
5    int main()
6    {
7       int i, j;
8       int a[3][4] = {1,2,3,4,5,6,7,8,9,10,11,12};
9
10       for(i = 0; i <= 2; i = i + 1)
11        {
12          for(j = 0; j <= 3; j = j + 1)
13            printf ("a[%d][%d] = %d\t", i, j, a[i][j]);
```

```
14      printf ("\n");
15      }
16      getch();
17      return 0;
18   }
```

i.   When **i** is 0 and **j** is 1, the element in which row and which column is printed?
      [*Apabila **i** ialah 0 dan **j** ialah 1, elemen pada baris dan lajur manakah yang akan dipaparkan?*]

ii.   When **i** is 0 and **j** is 3, the element in which row and which column is printed?
      [*Apabila **i** ialah 0 dan **j** ialah 3, elemen pada baris dan lajur manakah yang akan dipaparkan?*]

iii. When **i** is 2 and **j** is 1, the element in which row and which column is printed?
      [*Apabila **i** ialah 2 dan **j** ialah 1, elemen pada baris dan lajur manakah yang akan dipaparkan?*]

2.   Write and run the following Program 13.2, then try answering questions that follow.
      [*Tulis dan laksanakan Program 13.2 serta jawab soalan-soalan berikutnya.*]

```
1    //Program 13.2
2    #include <stdio.h>
3    #include <conio.h>
4
5    int main()
6    {
7      int i, j;
8      int a[3][4] = {1,2,3,4,5,6,7,8,9,10,11,12};
9
10       for(i = 2; i >= 0; i = i - 1)
11       {
12        for(j = 3; j >= 0; j = j - 1)
13         printf ("a[%d][%d] = %d\t", i, j, a[i][j]);
14        printf ("\n");
15       }
16     getch();
17     return 0;
18   }
```

i.   When **i** is 2 and **j** is 3, the element in which row and which column is printed?
      [*Apabila **i** ialah 2 dan **j** ialah 3, elemen pada baris dan lajur manakah yang akan dipaparkan?*]

ii.   When **i** is 2 and **j** is 2, the element in which row and which column is printed?

[*Apabila **i** ialah 2 dan **j** ialah 2, elemen pada baris dan lajur manakah yang akan dipaparkan?*]

iii. When **i** is 2 and **j** is 0, the element in which row and which column is printed?
[*Apabila **i** ialah 2 dan **j** ialah 0, elemen pada baris dan lajur manakah yang akan dipaparkan?*]

iv. When **i** is 1 and **j** is 3, the element in which row and which column is printed?
[*Apabila **i** ialah 1 dan **j** ialah 3, elemen pada baris dan lajur manakah yang akan dipaparkan?*]

v. When the last element is printed, what is **i** and what is **j**?
[*Apabila elemen terakhir dipaparkan, apakah nilai **i** dan**j**?*]

3. What is the output of the following code fragment of Program 13.3?
[*Apakah output bagi keratan Program 13.3 berikut?*]

```
1   //Program 13.3
2   int array[3][3], index1, index2;
3   for(index1=0;index1<3;index1++)
4        for(index2=0;index2<3;index2++)
5            array[index1][index2]=index1 + index2;
6    for(index1=0;index1<3;index1++)
7    {
8        for(index2=0;index2<3;index2++)
9            printf ("%d", array[index1][index2]);
10           printf ("\n");
11       }
```

EXERCISE 2:
[*LATIHAN 2*]

1. Run the following program and enter this data: **a, b, c, d, e, f, g, h, i, j, k, l**. Show the output and answer the questions.
    [*Laksanakan aturcara berikut dan masukkan data seperti berikut: **a, b, c, d, e, f, g, h, i, j, k, l.** Paparkan output dan jawab soalan-soalan berikut.*]

```
1   //Program 13.4
2   #include <stdio.h>
3   #include <conio.h>
4
5   int main()
6   {
7     int i, j;
8     char a[3][4];
9     for(i = 0; i <= 2; i = i + 1)
10     for(j = 0; j <= 3; j = j + 1)
11       scanf ("%d", &a[i][j]);
12
13     for(i = 0; i <= 2; i = i + 1)
14     {
15       for(j = 0; j <= 3; j = j + 1)
16         printf ("a[%d][%d] = %d\t", i, j, a[i][j]);
17       printf ("\n");    }
18     getch();
19     return 0;
20  }
21
```

i. Fill in the box given in Figure 13.1 with all the characters are read properly into this array.
    [*Lengkapkan kotak kosong yang terdapat pada Rajah 13.1 dengan aksara dibaca mengikut aturan yang betul ke dalam tatasusunan.*]

Figure 13.1